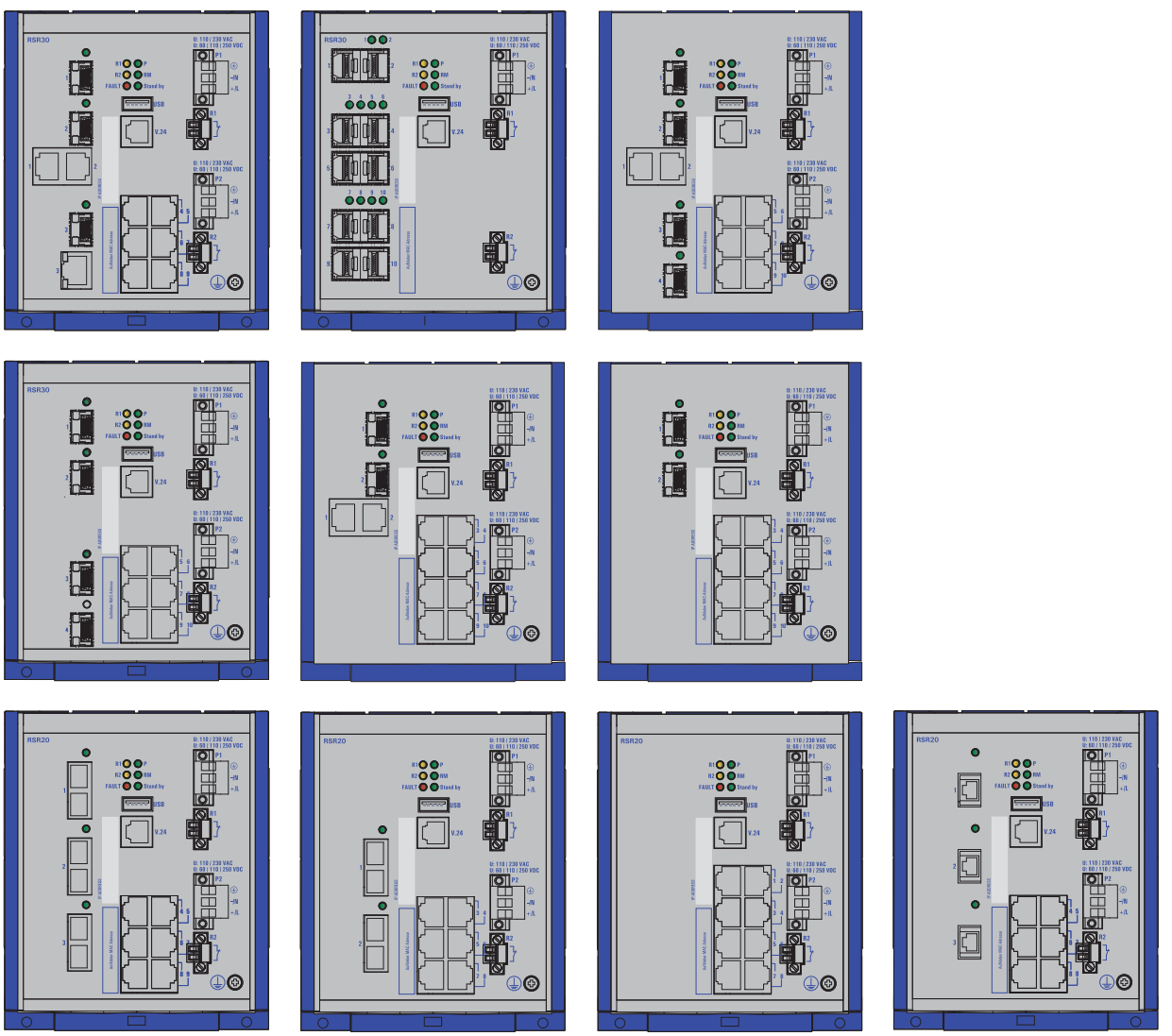
HIRSCHMANN

A BELDEN BRAND

User Manual

Installation
Industrial ETHERNET Rail Switch Rugged
RSR20/RSR30 Family



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Safety instructions

Notes on safety

This manual contains instructions to be observed for ensuring your personal safety and for preventing damage. The warnings appear next to a warning triangle with a different heading depending on the degree of danger posed:

Danger!
Means that death, serious physical injury or significant damage to property **will occur** if the corresponding safety measures are not carried out.

Warning!
Means that death, serious physical injury or significant damage to property **could occur** if the corresponding safety measures are not carried out.

Caution!
Means that minor physical injury or damage to property can occur if the required safety measures are not carried out.

Note: Contains important information on the product, on how to manage the product, or on the respective section of the documentation to which your special attention is being drawn.

Certified usage

The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by the manufacturer. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Supply voltage

The supply voltage is electrically isolated from the housing.

- ☐ Use undamaged parts.
- ☐ The device does not contain any service components. Internal fuses only trigger if there is a fault in the device. If the device is not functioning correctly, or if it is damaged, switch off the voltage supply and return the device to the plant for inspection.

☐ Only switch on the supply voltage to the device if
- the housing is closed,
- the terminal blocks are wired up correctly and
- the terminal blocks are connected.

☐ Connect the protective conductor with the ground screw before you set up the other connections. When removing the connections, you remove the protective conductor last.

☐ Make sure that the cross-section of the protective conductor cable is the same size as or bigger than the cross-section of the voltage supply cables.

☐ Only use connection cables that are permitted for the specified temperature range.

☐ WARNING:
- If the neutral conductor or the negative terminal of the supply voltage is not grounded
- If you are using a DC voltage greater than 125 VDC for the supply voltage

install a suitable input fuse.
For power supply units with product code "K", use a slow-blow fuse with a nominal rating of 2.5 A for the voltage supply input.
For power supply units with product code "C", use a slow-blow fuse with a nominal rating of 6.3 A.
With AC power supply, use a cable cross-section of at least 0.75 mm² (for North America AWG 18) for the current conductor at the voltage input.
With DC power supply, use a cable cross-section of at least 1.0 mm² (for North America AWG 16) for the current conductor at the voltage input.

☐ Relevant for North America:
Only use 75 °C copper wire.

Note: Only connect a supply voltage that corresponds to the type plate of your device.
Power supply type "C": 24 to 48 V DC
Power supply type "K": 60 to 250 V DC or 110 to 230 V AC

Shielding ground

The shielding ground of the connectable twisted pairs lines is connected to the front panel as a conductor.

☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

Housing

Only technicians authorized by the manufacturer are permitted to open the housing.

The device is grounded via the separate ground screw. It is located on the bottom left of the front panel.

- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.
- ☐ The ventilation slots must not be covered so as to ensure free air circulation.
- ☐ The clearance to the ventilation slots of the housing must be at least 10 cm (3.94 in).
- ☐ For devices with temperature range "U" or "F", the distance to the next device must be at least 2 cm (0.79 in).

Warning!
Never insert sharp objects (small screwdrivers, wires, etc.) into the inside of the product. There is the risk of an electric shock.

- ☐ The device must be installed in the vertical position.
- ☐ If installed in a living area or office environment, the device must be operated exclusively in switch cabinets with fire protection characteristics according to EN 60950-1.

Environment

The device may only be operated at the specified surrounding air temperature (temperature of the ambient air at a distance of up to 5 cm (1.97 in) from the device) and relative air humidity specified in the technical data.

- ☐ Install the device in a location where the climatic threshold values specified in the technical data will be observed.
- ☐ Use the device only in an environment within the contamination level specified in the technical data.

Qualification requirements for personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- ▶ trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- ▶ trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- ▶ trained in providing first aid.

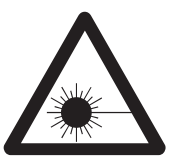
General safety instructions

Electricity is used to operate this equipment. Comply with every detail of the safety requirements specified in the operating instructions regarding the voltages to apply (see page 4).

Non-observance of these safety instructions can therefore cause material damage and/or serious injuries.

- ☐ Only appropriately qualified personnel should work on this device or in its vicinity. These personnel must be thoroughly familiar with all the warnings and maintenance procedures in accordance with this operating manual.
- ☐ The proper and safe operation of this device depends on proper handling during transport, proper storage and assembly, and conscientious operation and maintenance procedures.
- ☐ Never start operation with damaged components.
- ☐ Only use the devices in accordance with this manual. In particular, observe all warnings and safety-related information.
- ☐ Any work that may be required on the electrical installation may only be carried out by personnel trained for this purpose.

Note: LED or LASER components in compliance with IEC 60825-1 (2001):
CLASS 1 LASER PRODUCT
CLASS 1 LED PRODUCT



Warning
Laser light
Do not look into the beam or view it directly with optical instruments (e.g. magnifying glasses, microscopes). Failure to observe this warning within a distance of 100 mm can endanger your sight.
Light is emitted from the optical connections or from the ends of the optical fibers that are connected to them. Light Emitting Diode CLASS 2M, wave length 650 nm, power <2 mW, according to
DIN EN 60825-1:2003-10.

National and international safety regulations

- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

CE marking

The devices comply with the regulations contained in the following European directive(s):

2004/108/EG
Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.

In accordance with the above-named EU directive(s), the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Tel.: +49 1805 141538

The product can be used in living areas (living area, place of business, small business) and in industrial areas.

- Interference immunity: EN 61000-6-2:2005
- Emitted interference: EN 55022:2006 + A1:2007 Class A

Warning!
This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.
The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

FCC note:

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference; (2) this device must accept any interference received, including interference that may cause undesired operation.
Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.
These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment. The device creates and uses high frequencies and can radiate same, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

Instructions for Use in Hazardous Locations

SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.

⚠ WARNING

EXPLOSION HAZARD
Substitution of any components may impair suitability for CLASS I, DIVISION 2.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

EXPLOSION HAZARD
Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

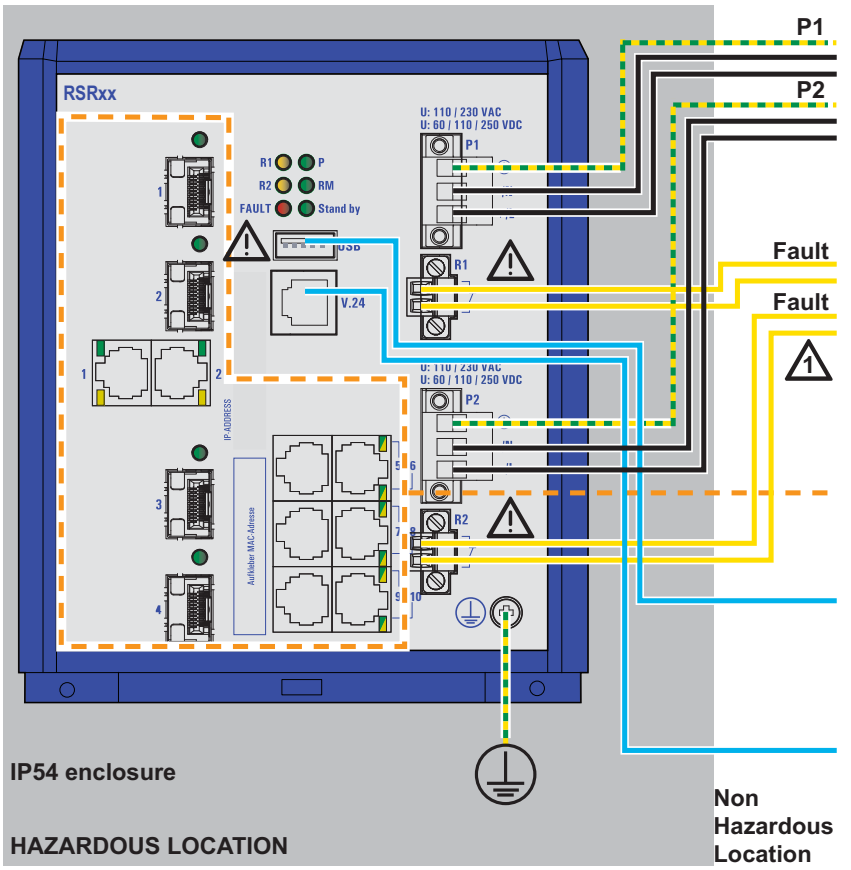
Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

EXPLOSION HAZARD
The USB connector is for temporary connection only. Do not use, connect, or disconnect unless area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CONTROL DRAWING: Hazardous Locations Class I Division 2 Groups A, B ,C ,D



P1
P2

Power supply (Redundant)
Type "K": 110-230VAC or 60-250VDC
Type "C": 24-48VDC
(protective earthing conductors Type "K" only)

Fault
Fault

Fault contacts. Equipment with nonincendive field wiring parameters:
V<30V I<90mA
L_i<0,5µH C_i<20pF

Data communication Ethernet Ports

ACA21-USB
Auto Configuration Adapter
For maintenance only - See Installation Instructions

V.24 Interface (External management)

Notes:

1. The nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus and associated nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations when certain parametric conditions are met.

   $C_a >= C_i + C_{cable}$; $L_a >= L_i + L_{cable}$

   Nonincendive field wiring circuits must be wired in accordance with the National Electrical Code (NEC), NFPA 70 , article 501.

Nonincendive Field Wiring Parameters:

Entity Parameters for Class I Division 2 Groups A,B,C,D	V_{max} [V]	I_{max} [mA]	C_i [pF]	L_i [µH]
Connector: 2 pole	30	90	20	0.5
Contacts: Fault contacts	30	90	20	0.5

Warnung!
EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR HAZARDOUS LOCATIONS OR EXPLOSIVE ATMOSPHERES.

EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

DO NOT OPEN WHEN ENERGIZED.

Table 1: CONTROL DRAWING for RSR20 / RSR30 family
Document No.: 000144941DNR

Recycling note

After usage, this product must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state and country.

About this manual

The following manuals are included as PDF files on the enclosed CD ROM:

- User manual „Installation“
- User manual “Basic configuration”
- User manual “Redundancy configuration”
- Reference manual “Web-based Interface” and
- Reference manual “Command Line Interface”

The Network Management Software HiVision/Industrial HiVision provides you with additional options for smooth configuration and monitoring:

- Configuration of multiple devices simultaneously.
- Graphical interface with network layouts.
- Auto-topology discovery.
- Event log.
- Event handling.
- Client / Server structure.
- Browser interface
- ActiveX control for SCADA integration
- SNMP/OPC gateway

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Device description

The Rail Switch Rugged RSR20/RSR30 series provides you with a range of Switch variants. You set up your own Switch according to your requirements regarding the number of ports, transmission speed, media type, connector type, temperature range, certifications and software variant.

The devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility. The devices operate without fans and have a redundant voltage supply. The Switches are mounted very quickly by snapping them onto a hat rail, or by mounting them on a wall.

The HIPER-Ring redundancy concept enables you to quickly carry out a reconfiguration, and also a simple configuration with only one additional connection. The diagnosis display and the display of the operating parameters and IP address information field provide a quick overview.

It can be easily managed via a Web browser, via Telnet, via SSH, with a management software product (such as HiVision) or locally on the Switch (V.24 interface).

The devices allow you to set up switched industrial ETHERNET networks that conform to the IEEE 802.3 and 802.3u standards using copper wires or optical fibers in a line or ring structure. You can connect terminal devices and other infrastructure components via twisted pair cables, multi-mode F/O and single-mode F/O. The twisted pair ports support autocrossing, autonegotiation and autopolarity.

Depending on the software you choose, the devices provide you with a large range of functions:

- Redundancy functions (Rapid Spanning Tree, Redundant Ring Structure, HIPER-Ring, Redundant Coupling, Link Aggregation, Redundant Power Supply)
- Protection from unauthorized access
- Synchronization of system time in the network (SNTP, PTP)
- Network load control and limitation
- Network filter
- Operation diagnosis
- Diagnostics (hardware self-testing)
- Reset
- Priority
- VLAN
- Topology discovery

- Web-based Interface
- Command Line Interface CLI
- SNMP
- 802.1x port authentication
- Real Time Clock (Professional software variant)

The addition to the Open Rail Rugged RS20/RS30 series of the Open Rail RS20/RS30/RS40 series, the Switches of the MICE series, the MACH series of backbone Switches, the BAT wireless transmission system, the EAGLE security system, and products for the LION control room, provides continuous communication across all levels of the company.

1.1 Description of the device variants

The devices differ with regard to the range of software functions, the number of interfaces, and the media type for connecting segments.

- The RSR30-... device variants are Rail Switches Rugged with 2 to 3 gigabit Ethernet ports (1000 Mbit/s) and six to eight 10/100 Mbit/s Ethernet ports.
- The RSR20-... device variants are Rail Switches Rugged without gigabit Ethernet ports and eight to nine 10/100 Mbit/s Ethernet ports.

The devices also provide you with the following options for selecting the variant you desire:

- Temperature range:
  - Standard (0°C to 60°C)
  - Extended (-40°C to +85 °C) without conformal coating
  - Extended (-40°C to +85 °C) with conformal coating
- Voltage ranges for power supply unit 1 and the optional power supply unit 2 (inclusive maximum tolerances):
  - 18 VDC to 60 VDC
  - 48 VDC to 320 VDC or 90 VAC to 265 VAC
- Software variant: Professional

The devices comply with the specifications of the ISO/IEC standards
8802-3u 100BASE-TX/-1000BASE-T,
8802-3 100BASE-FX and
8802-3 1000BASE-SX/LX.

1.1.1 Combination options RSR20/RSR30

The product designation of your device is made from combining the desired product characteristics in accordance with the following table. The short designation is in column 3.

Item	Characteristic feature	Characteristic value	Property
1 to 5	Product	RSR20	Rail Switch Rugged without gigabit ports
		RSR30	Rail Switch Rugged with gigabit ports
6	- (hyphen)	-	
7 to 8	Number of 100 Mbit/s ports	06	6 * 100 Mbit/s Ethernet
		07	7 * 100 Mbit/s Ethernet
		08	8 * 100 Mbit/s Ethernet
		09	9 * 100 Mbit/s Ethernet
9 and 10	Number of 1000 Mbit/s ports	00	0 * 1000 Mbit/s Ethernet
		02	2 * 1000 Mbit/s Ethernet
		03	3 * 1000 Mbit/s Ethernet
11 and 12	Port 1 and 2 or port 1	CC	2 * Combo port 1000 Mbit/s Ethernet
		OO	2 * SFP slots 1000 Mbit/s Ethernet
		MM	2 * Multimode FX (DSC)
		JJ	2 * Multimode FX (MTRJ)
		NN	2 * Multimode FX (ST)
		VV	2 * Singlemode FX (DSC)
		UU	2 * Singlemode FX (ST)
		LL	2 * Singlemode Long Haul FX (DSC)
		GG	2 * Singlemode Long Haul FX (DSC) 200 km
		O7	1 * Combo port 1000 Mbit/s Ethernet
		O6	1 * SFP slots 1000 Mbit/s Ethernet
		T1	1 * Twisted Pair TX (RJ45)
		M2	1 * Multimode FX (DSC)
		M3	1 * Multimode FX (MTRJ)
		M4	1 * Multimode FX (ST)
		S2	1 * Singlemode FX (DSC)
		S4	1 * Singlemode FX (ST)
		L2	1 * Singlemode Long Haul FX (DSC)
		G2	1 * Singlemode Long Haul FX (DSC) 200 km
13 and 14	Port 2 or port 3 and port 3 and 4	ZZ	2 * SFP slots (only 100 Mbit/s)
		O7	1 * Combo port 1000 Mbit/s Ethernet
		O6	1 * SFP slots 1000 Mbit/s Ethernet
		T1	1 * Twisted Pair TX (RJ45)
		M2	1 * Multimode FX (DSC)
		M3	1 * Multimode FX (MTRJ)
		M4	1 * Multimode FX (ST)
		S2	1 * Singlemode FX (DSC)
		S4	1 * Singlemode FX (ST)
		L2	1 * Singlemode Long Haul FX (DSC)
		G2	1 * Singlemode Long Haul FX (DSC) 200 km
15 and 16	Remaining ports	T1	Twisted Pair TX (RJ45)

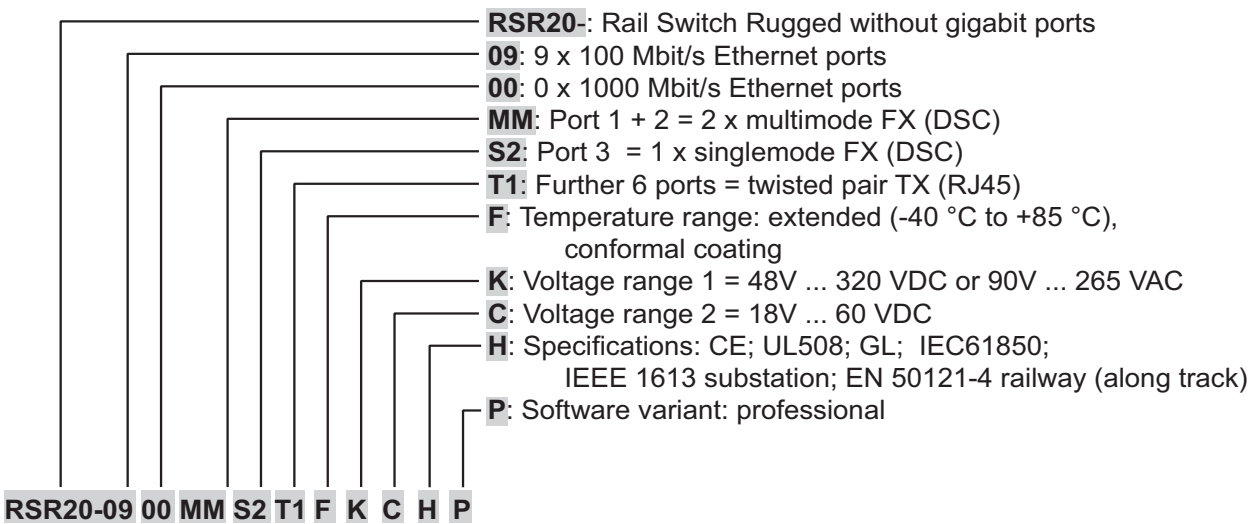
Table 2: Combination options for the device variants of RSR20/RSR30

Item	Characteristic feature	Characteristic value	Property
		Z6	SFP slot (only 100 Mbit/s)
17	Temperature range	S	Standard 0 °C to 60 °C
		U	Extended -40 °C to 85 °C
		F	Extended -40 °C to 85 °C and conformal coating
18	Voltage range 1 incl. maximum tolerances	C	18 VDC ... 60 VDC
		K	48 VDC ... 320 VDC or 90 VAC ... 265 VAC
19	Voltage range 2 incl. maximum tolerances	9	Not available
		C	18 VDC ... 60 VDC
		K	48 VDC ... 320 VDC or 90 VAC ... 265 VAC
20	Certifications	H	CE; UL508; GL; IEC61850; IEEE 1613 substation; EN 50121-4 railway (along track)
		C	CE; UL508; GL; IEC61850; IEEE 1613 substation; EN 50121-4 railway (along track); EN50155
21	Software feature version	P	Professional

Table 2: Combination options for the device variants of RSR20/RSR30

Examples for product name

Example: RSR20-0900...


RSR20-: Rail Switch Rugged without gigabit ports
09: 9 x 100 Mbit/s Ethernet ports
00: 0 x 1000 Mbit/s Ethernet ports
MM: Port 1 + 2 = 2 x multimode FX (DSC)
S2: Port 3 = 1 x singlemode FX (DSC)
T1: Further 6 ports = twisted pair TX (RJ45)
F: Temperature range: extended (-40 °C to +85 °C), conformal coating
K: Voltage range 1 = 48V ... 320 VDC or 90V ... 265 VAC
C: Voltage range 2 = 18V ... 60 VDC
H: Specifications: CE; UL508; GL; IEC61850; IEEE 1613 substation; EN 50121-4 railway (along track)
P: Software variant: professional
RSR20-09 00 MM S2 T1 F K C H P

1.1.2 Port number and media for RSR20-...

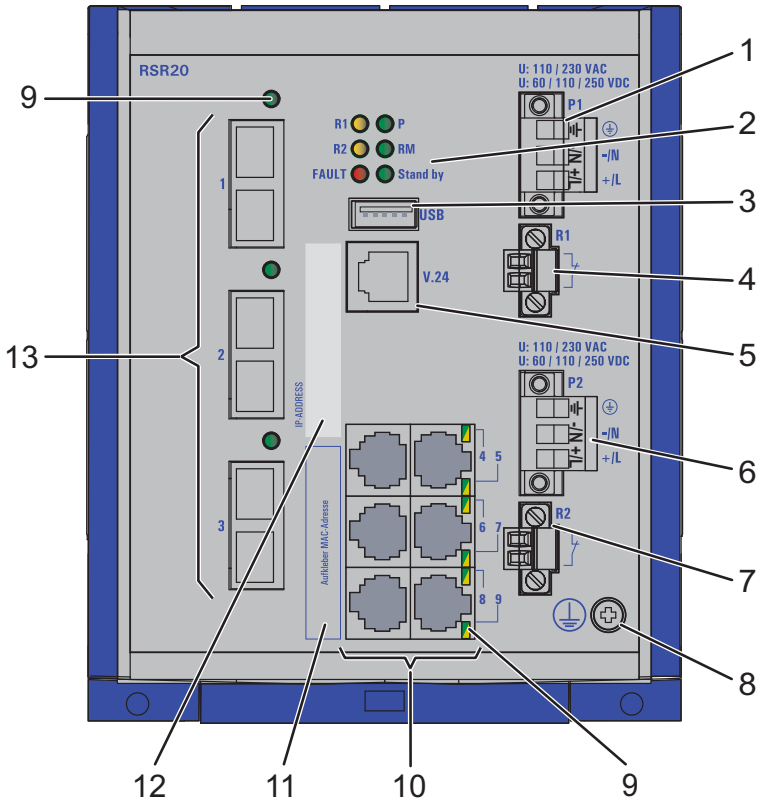
To put together your personal RSR20 device in the above table (see table 2), you have the following combination options
("?" = any value from the "Characteristic value" column):

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR20-0900	JJ	M3	T1	?	KK K9 KC CC	?P
-“-	MM	M2 M4 S2 S4 L2 G2	-“-	-“-	KK K9 KC CC	-“-
-“-	NN	-“-	-“-	-“-	-“-	-“-
-“-	VV	-“-	-“-	-“-	-“-	-“-
-“-	UU	-“-	-“-	-“-	-“-	-“-
-“-	LL	-“-	-“-	-“-	-“-	-“-
-“-	GG	-“-	-“-	-“-	-“-	-“-

Table 3: Combination options for RSR20-0900...

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR20-0800	T1	T1	T1	?	KK K9 KC CC	?P
-“-	M2	M2 M4 S2 S4 L2 G2	-“-	-“-	KK K9 KC CC	-“-
-“-	M2	-“-	-“-	-“-	-“-	-“-
-“-	S2	-“-	-“-	-“-	-“-	-“-
-“-	S4	-“-	-“-	-“-	-“-	-“-
-“-	L2	-“-	-“-	-“-	-“-	-“-
-“-	G2	-“-	-“-	-“-	-“-	-“-

Table 4: Combination options for RSR20-0800...

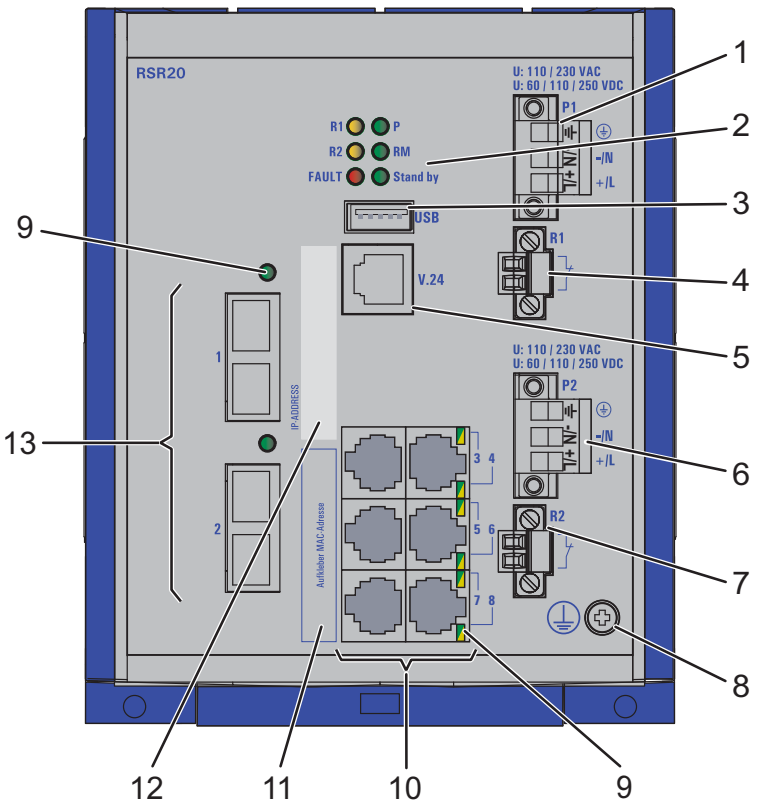


1	Connection Supply voltage 1	alternatively, depending on device variant	Product code Position 18	C	2-pin terminal block
					18 V DC to 60 V DC
				K	3-pin terminal block
					48 V DC to 320 V DC
					90 V AC to 265 V AC
2	LED display elements	Device Status			
3	USB interface				
4	Connection	Signal contact 1			
5	V.24 connection for external management				
6	Connection Supply voltage 2	alternatively, depending on device variant	Product code Position 19	9	not assembled
				C	2-pin terminal block
					18 V DC to 60 V DC
				K	3-pin terminal block
					48 V DC to 320 V DC
					90 V AC to 265 V AC
7	Connection	Signal contact 2			
8	Grounding screw				
9	LED display elements	port state			
10	port 4 to 9 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX	
			Connection type	RJ45	

Table 5: RSR20 device variants with 3 fiber optic ports (DSC/ST) and 6 twisted pair ports (RJ45)

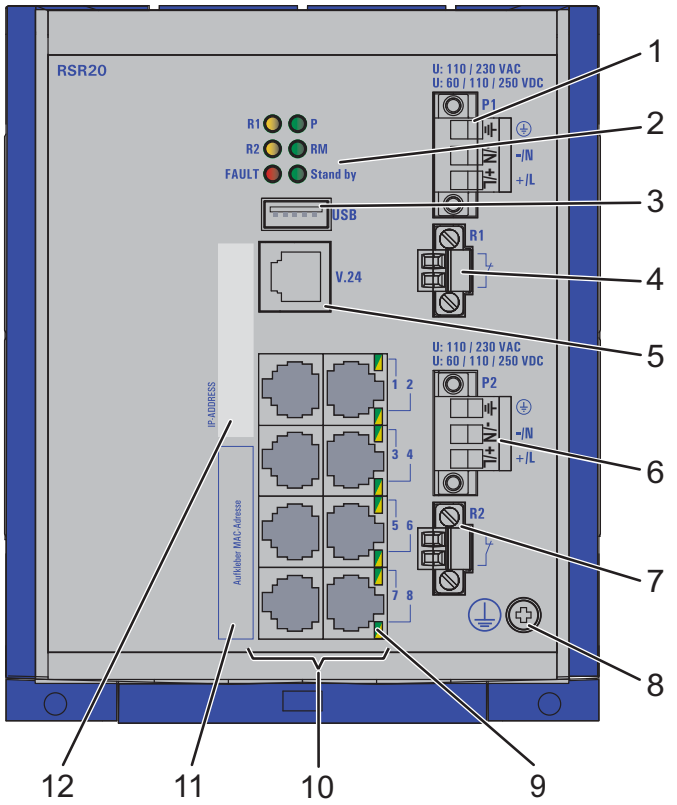
11	MAC address field			
12	IP address field			
13	Ports 1 to 3 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX
			Connection type	depending on device variant: DSC / ST

Table 5: RSR20 device variants with 3 fiber optic ports (DSC/ST) and 6 twisted pair ports (RJ45)



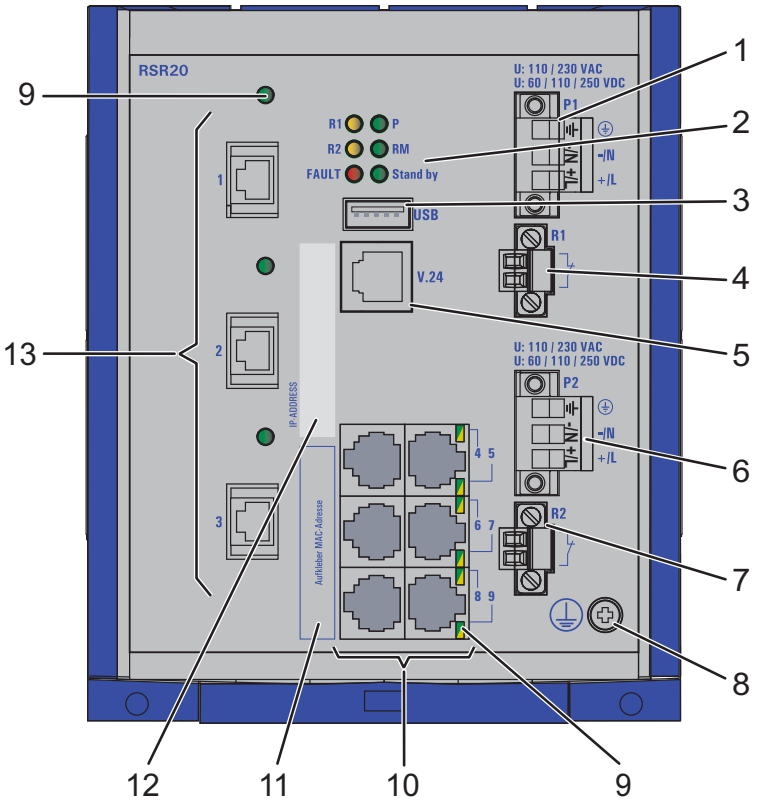
1 to 9	(see table 5)			
10	port 3 to 8 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX
			Connection type	RJ45
11	MAC address field			
12	IP address field			
13	port 1 to 2 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX
			Connection type	depending on device variant: DSC / ST

Table 6: RSR20 device variants with 2 fiber optic ports (DSC/ST) and 6 twisted pair ports (RJ45)



1 to 9	(see table 5)			
10	port 1 to 8 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX
			Connection type	RJ45
11	MAC address field			
12	IP address field			

Table 7: RSR20 device variants with 8 twisted pair ports (RJ45)



1 to 9	(see table 5)			
10	port 4 to 9 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX
			Connection type	RJ45
11	MAC address field			
12	IP address field			
13	Ports 1 to 3 (LAN only)	Fiber optic cable	Type of fiber	Multimode
			Standard	ISO/IEC 8802-03 100BASE-FX
			Connection type	MTRJ

Table 8: RSR20 device variants with 3 fiber optic ports (MTRJ) and 6 twisted pair ports (RJ45)

1.1.3 Port number and media for RSR30-...

To put together your personal RSR30 device in the above table (see table 2), you have the following combination options
("?" = any value from the "Characteristic value" column):

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR30-0603	CC	O7	T1	?	KK K9 KC CC	?P

Table 9: Combination options for RSR30-0603...

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR30-0802	CC	ZZ	T1	?	KK K9 KC CC	?P
-“-	O7	O7	-“-	-“-	-“-	-“-
-“-	OO	ZZ	-“-	-“-	-“-	-“-
-“-	O6	O6	-“-	-“-	-“-	-“-

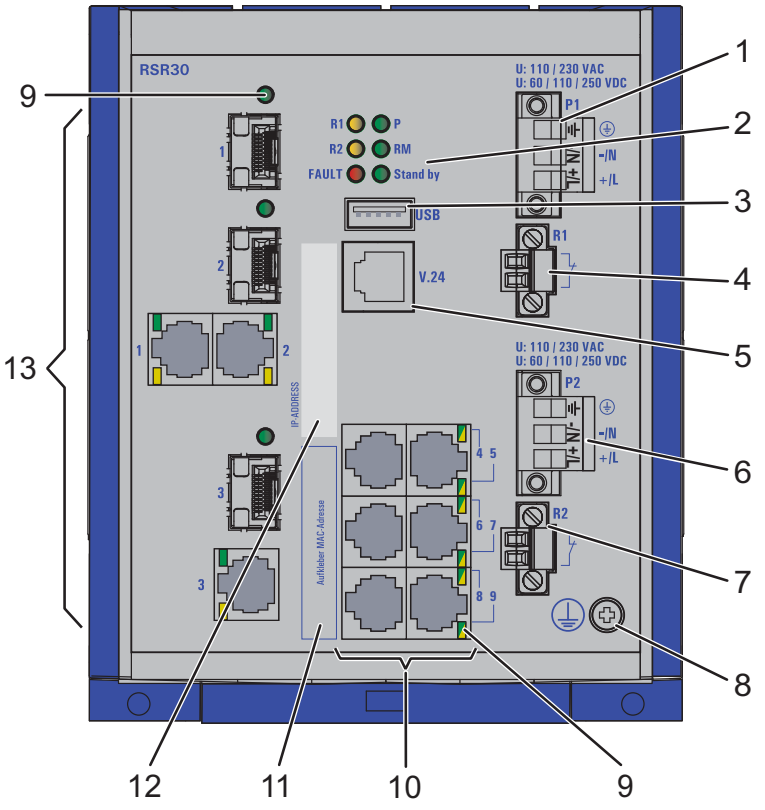
Table 10: Combination options for RSR30-0802...

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR30-0703	OO	ZZ	Z6	?	K9	?P

Table 11: Combination options for RSR30-0703...

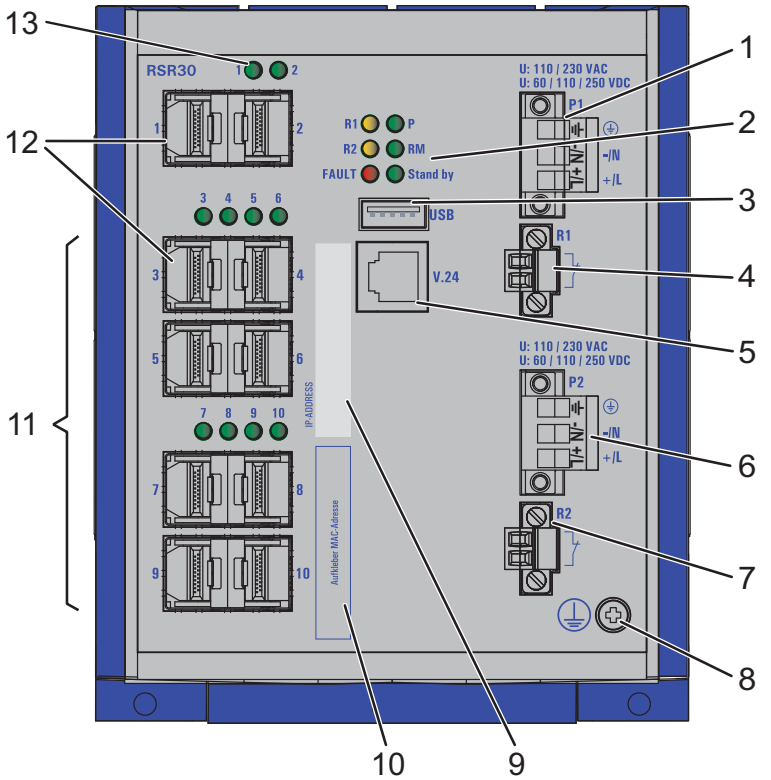
For device variants with combo ports (fiber optic SFP slot as alternative to RJ45 connection), the following applies:

- SFP slots: 100/1000Mbit/s
- RJ45 connection: 10/100/1000MBit/s



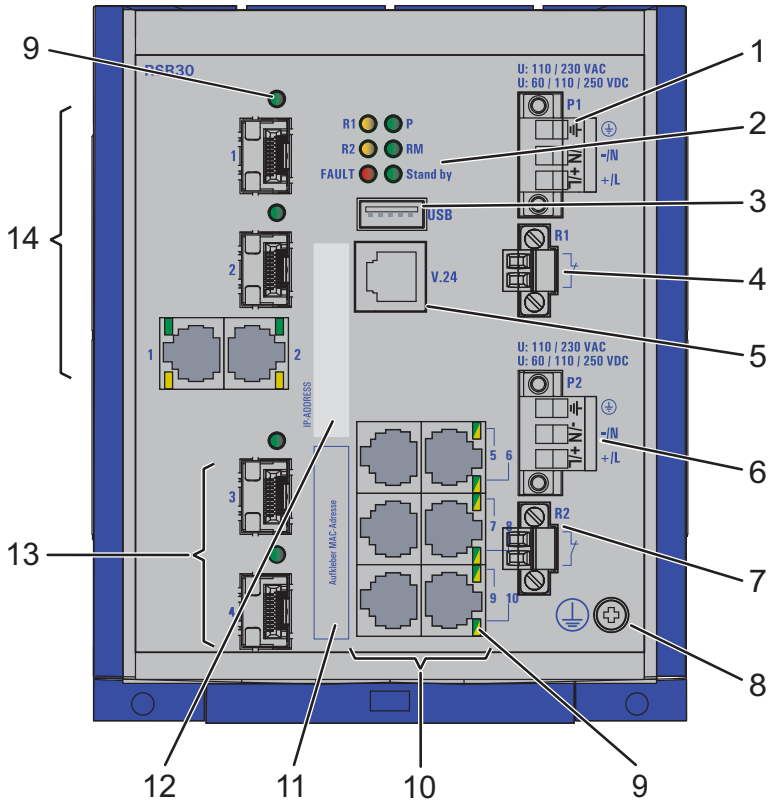
1 to 9	(see table 5)				
10	port 4 to 9 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX	
			Connection type	RJ45	
11	MAC address field				
12	IP address field				
13	Ports 1 to 3 (combo ports) (LAN only)	alternatively	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX
					ISO/IEC 8802-03 1000BASE-SX/LX
				Connection type	SFP slot
			Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX/ 1000BASE-T
				Connection type	RJ45

Table 12: RSR30 device variants with 3 combo ports and 6 twisted pair ports (RJ45)



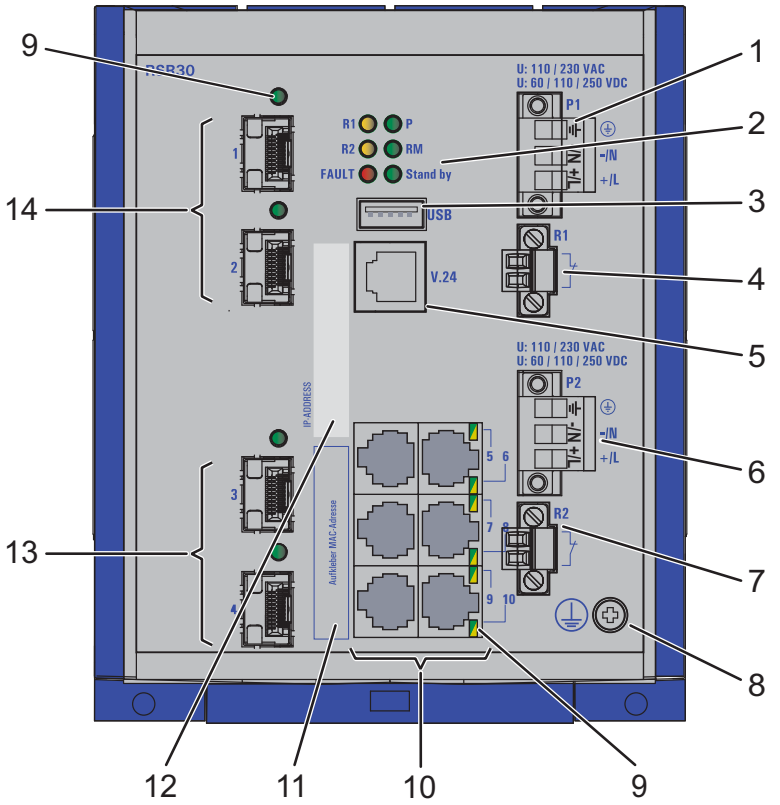
1 to 8	(see table 5)			
9	IP address field			
10	MAC address field			
11	port 4 to 10 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX
			Connection type	SFP slot
12	Ports 1 to 3 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 1000BASE-SX/LX
			Connection type	SFP slot
13	LED display elements	port state		

Table 13: RSR30 device variants with 7 plus 3 SFP slots (100 and 1000 Mbit/s)



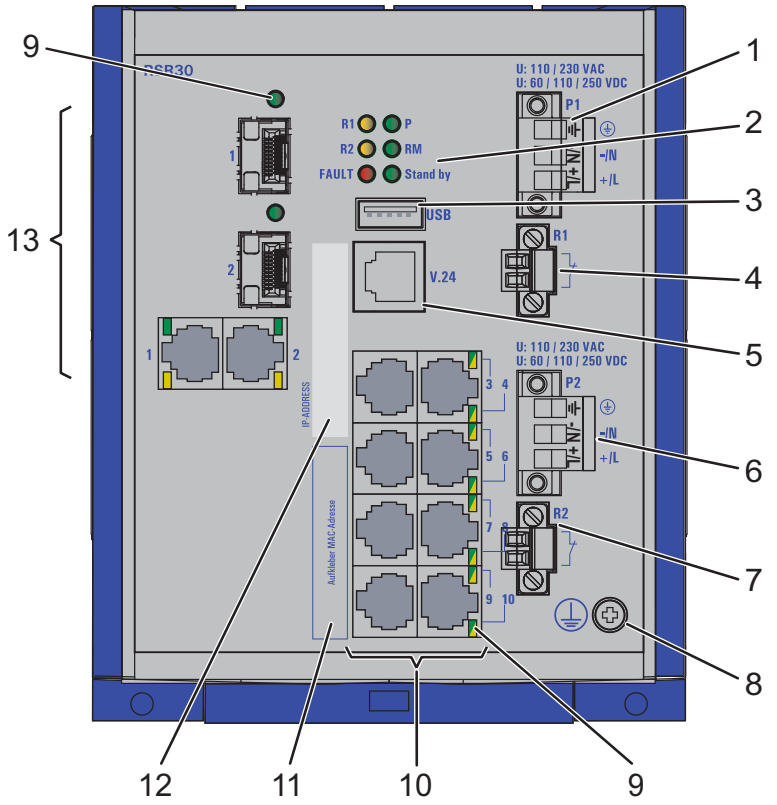
1 to 9	(see table 5)				
10	port 5 to 10 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX	
			Connection type	RJ45	
11	MAC address field				
12	IP address field				
13	port 3 to 4 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX	
			Connection type	SFP slot	
14	port 1 to 2 (combo ports) (LAN only)	alternatively	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX
					ISO/IEC 8802-03 1000BASE-SX/LX
				Connection type	SFP slot
			Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX/ 1000BASE-T
				Connection type	RJ45

Table 14: RSR30 device variants with 2 combo ports, 2 SFP slots and 6 twisted pair ports (RJ45)



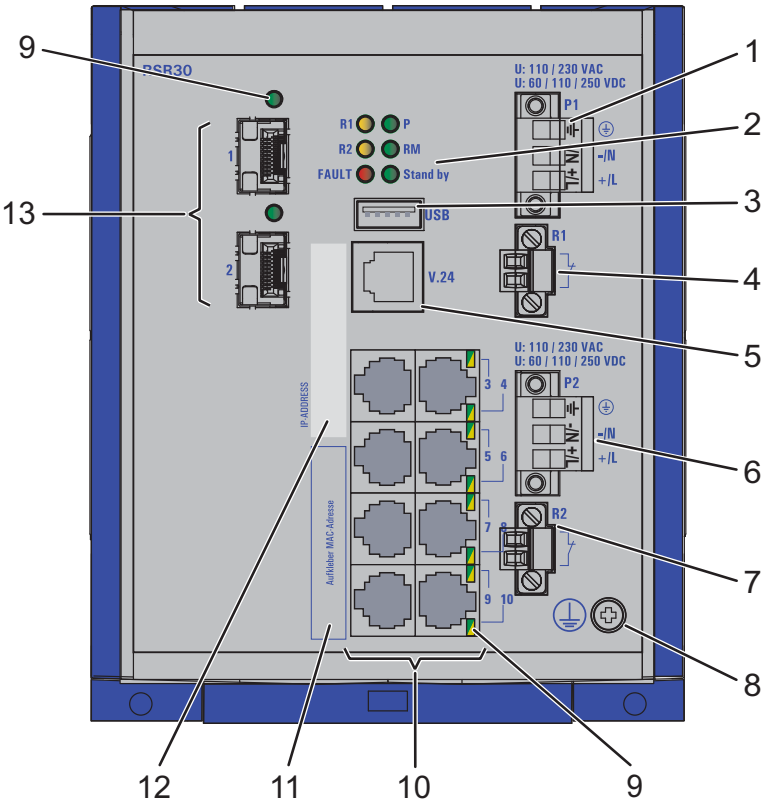
1 to 9	(see table 5)			
10	port 5 to 10 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX
			Connection type	RJ45
11	MAC address field			
12	IP address field			
13	port 3 to 4 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX
			Connection type	SFP slot
14	port 1 to 2 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 1000BASE-SX/ LX
			Connection type	SFP slot

Table 15: RSR30 device variants with 2 plus 2 SFP slots (100 and 1000 Mbit/s) and 6 twisted pair ports (RJ45)



1 to 9	(see table 5)				
10	port 3 to 10 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX	
			Connection type	RJ45	
11	MAC address field				
12	IP address field				
13	port 1 to 2 (combo ports) (LAN only)	alternatively	Fiber optic cable	Standard	ISO/IEC 8802-03 100BASE-FX
					ISO/IEC 8802-03 1000BASE-SX/LX
				Connection type	SFP slot
			Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/100BASE-TX/1000BASE-T
				Connection type	RJ45

Table 16: RSR30 device variants with 2 combo ports and 8 twisted pair ports (RJ45)



1 to 9	(see table 5)			
10	port 3 to 10 (LAN only)	Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX
			Connection type	RJ45
11	MAC address field			
12	IP address field			
13	port 1 to 2 (LAN only)	Fiber optic cable	Standard	ISO/IEC 8802-03 1000BASE-SX/ LX
			Connection type	SFP slot

Table 17: RSR30 device variants with 2 SFP slots and 8 twisted pair ports (RJ45)

2 Assembly and start-up

The devices have been developed for practical application in a harsh industrial environment. The installation process is correspondingly simple. On delivery, the device is ready for operation.

The following steps should be performed to install and configure a switch:

- Unpacking and checking
- Installing the SFP modules
- Installing the device and grounding
- Connecting the terminal blocks for voltage supply and signal contact and connecting the supply voltage
- Installing the terminal blocks; start-up procedure
- Installing the data lines

2.1 Installing the device

2.1.1 Unpacking and checking

☐ Check that the contents of the package are complete (see page 53 „Scope of delivery“).
☐ Check the individual parts for transport damage.

2.1.2 Installing the SFP modules (optional)

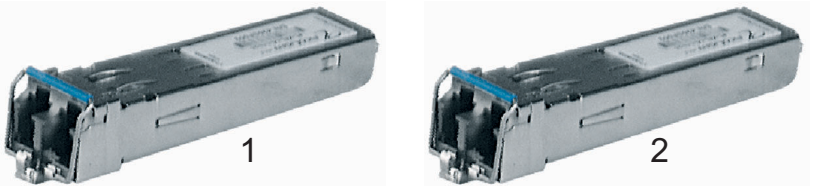


Figure 1: 1 - Fast EHTERNET fiber optic SFP module
2 - Gigabit ETHERNET fiber optic SFP module

☐ Before attaching an SFP module, first remove the protective cap over the socket.
☐ Push the SFP module with the lock closed into the socket until it latches audibly in place.

Note: Only use Hirschmann SFP modules (see page 53 „Accessories“).

2.1.3 Insert data in label area

The information field for the IP address on the front of the device helps you to structure your network installation clearly.

2.1.4 Connecting the terminal blocks for supply voltage and signal contact

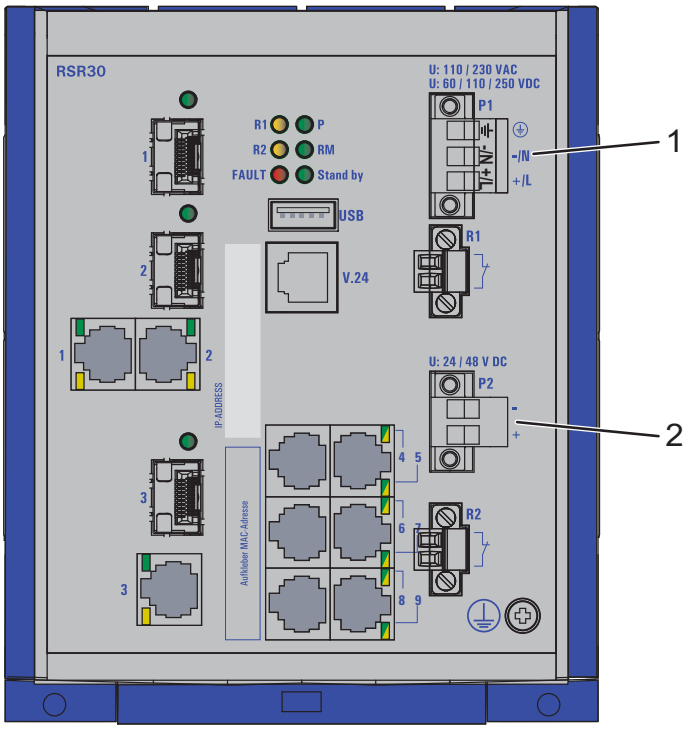


Table 18: Connecting the supply voltage

1	Connection Supply voltage 1	alternatively, depending on device variant	Product code Position 18	C	2-pin terminal block
					18 V DC to 60 V DC
				K	3-pin terminal block
					48 V DC to 320 V DC
					90 V AC to 265 V AC
6	Connection Supply voltage 2	alternatively, depending on device variant	Product code Position 19	9	not assembled
				C	2-pin terminal block
					18 V DC to 60 V DC
				K	3-pin terminal block
					48 V DC to 320 V DC
					90 V AC to 265 V AC

The supply voltage is connected - depending on the device variant - via a 3-pin or 2-pin terminal block with screw locking.

The signal contacts are connected via a 2-pin terminal block with screw locking.

☐ Pull the terminal block off the device and connect the voltage supply lines and the signal lines.

Note: Relevant for North America:
The tightening torque for field wiring terminals is max. 4.4 lb in (0,5 Nm).

Supply voltage

In devices with two voltage inputs, the supply voltage can be connected redundantly. Both inputs are uncoupled. There is no distributed load. The supply voltage is electrically isolated from the housing.

Note: With non-redundant supply of the main voltage, the device reports a loss of power. You can avert this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

Depending on the variant, the devices have one or two terminal blocks (2-pin or 3-pin) for connecting the supply voltage.
The voltage ranges of the terminal blocks are specified in the product code in positions 18 and 19. (see table 2):

- Low voltage: 18 to 60 V DC (2-pin terminal block)
- High voltage: 48 to 320 V DC or 90 to 265 V AC (3-pin terminal block)

Caution!
Note the safety instructions (see page 4 „Notes on safety“) and only connect a supply voltage that corresponds to the type plate of your device. Make sure that the contact load capability of the signal contact is not exceeded (see page 48 „Technical data“).

High voltage input

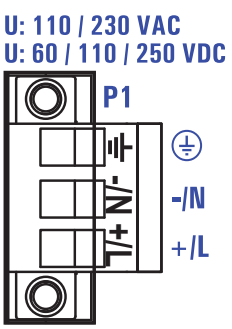


Figure 2: Pin assignment of the 3-pin terminal blocks (high voltage input)

The supply voltage is connected via pin 2 and pin 3, and the protective conductor is connected via pin 1. You can choose between DC or AC voltage when connecting to terminal blocks for high voltage.

- Connections for DC voltage:
  +/L: plus terminal of the supply voltage
  -/N: minus terminal of the supply voltage
  ⏚ Protective conductor

▶ Connections for AC voltage:
+/L: "phase" supply voltage
-/N: neutral conductor
⏚ Protective conductor

☐ First connect the protective conductor to the protective conductor terminal.

☐ Connect the supply voltage via the 3-pin terminal block. Pay attention to the +/L and -/N connections.

☐ If the neutral conductor or the minus terminal of the supply voltage is not grounded, install a suitable fuse in the input line.

☐ Install a suitable external fuse in the supply voltage input line (+ terminal) if you are using a DC voltage greater than 125 VDC for the supply voltage.

Low voltage input

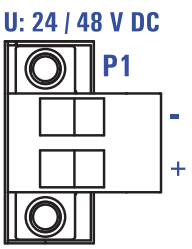


Figure 3: Pin assignment of the 2-pin terminal blocks (low voltage input)

The supply voltage is connected via pin 1 and pin 2.

▶ Pin assignment:
+: plus terminal of the supply voltage
- : minus terminal of the supply voltage

☐ Connect the DC voltage to the 2-pin terminal block.

Signal contacts

Figure 4: Pin assignment of the "R1" and "R2" signal contact at RSR20.../RSR30...

You have two signal contacts for each device.

- The signal contact (“FAULT”) monitors the functions of the device, thus enabling remote diagnostics. You can specify the type of function monitoring in the Management.
- You can also use the Management to switch the signal contact manually and thus control external devices.

A break in contact is used to report the following conditions via the potential-free signal contact (relay contact, closed circuit):

- The failure of at least one of the two voltage supplies (voltage supply 1 or 2 is below the threshold value).
- A continuous malfunction in the device (internal supply voltage).
- The defective link status of at least one port. The report of the link status can be masked by the Management for each port. In the default state, link status monitoring is deactivated.
- The temperature threshold value has been exceeded or has fallen below.
- The removal of the ACA.

The following condition is also reported in RM mode:

- Ring redundancy guaranteed. By default, there is no ring redundancy monitoring

2.1.5 Installing the device and grounding

You can mount the device on the DIN rail or mount it on the wall using the wall mounting plate supplied (see on page 53 „Accessories“).

Mounting on the DIN rail

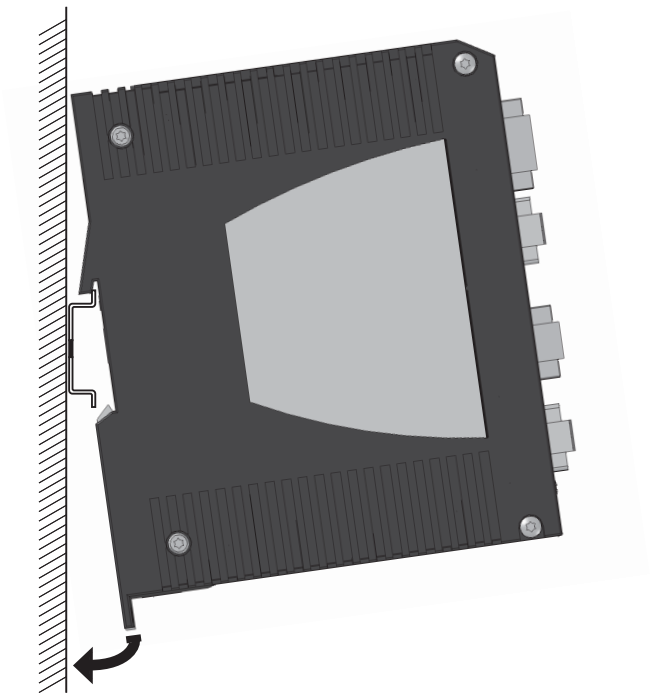


Figure 5: Mounting on the DIN rail

☐ Mount the device on a 35 mm DIN rail in accordance with DIN EN 60175.
☐ Attach the upper snap-in guide of the device into the DIN rail and press it down against the DIN rail until it snaps into place.

Note: The shielding ground of the industrial connectable twisted pair lines is connected to the lower panel as a conductor.

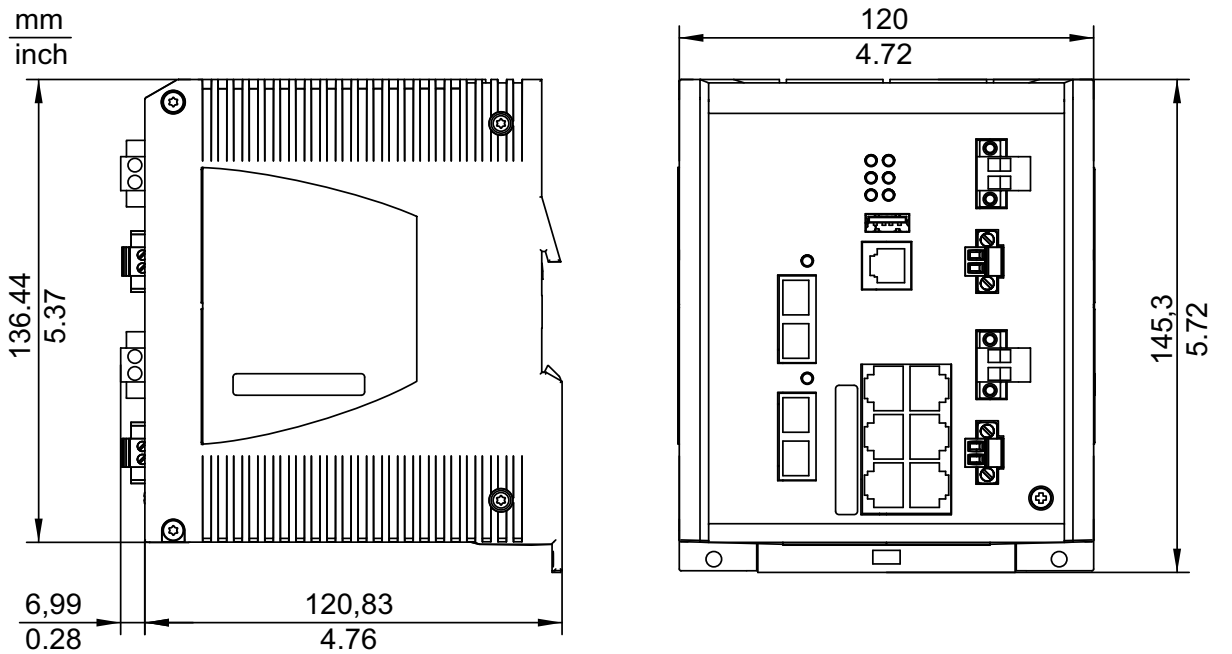
Wall mounting

Figure 6: Mounting the device on the wall

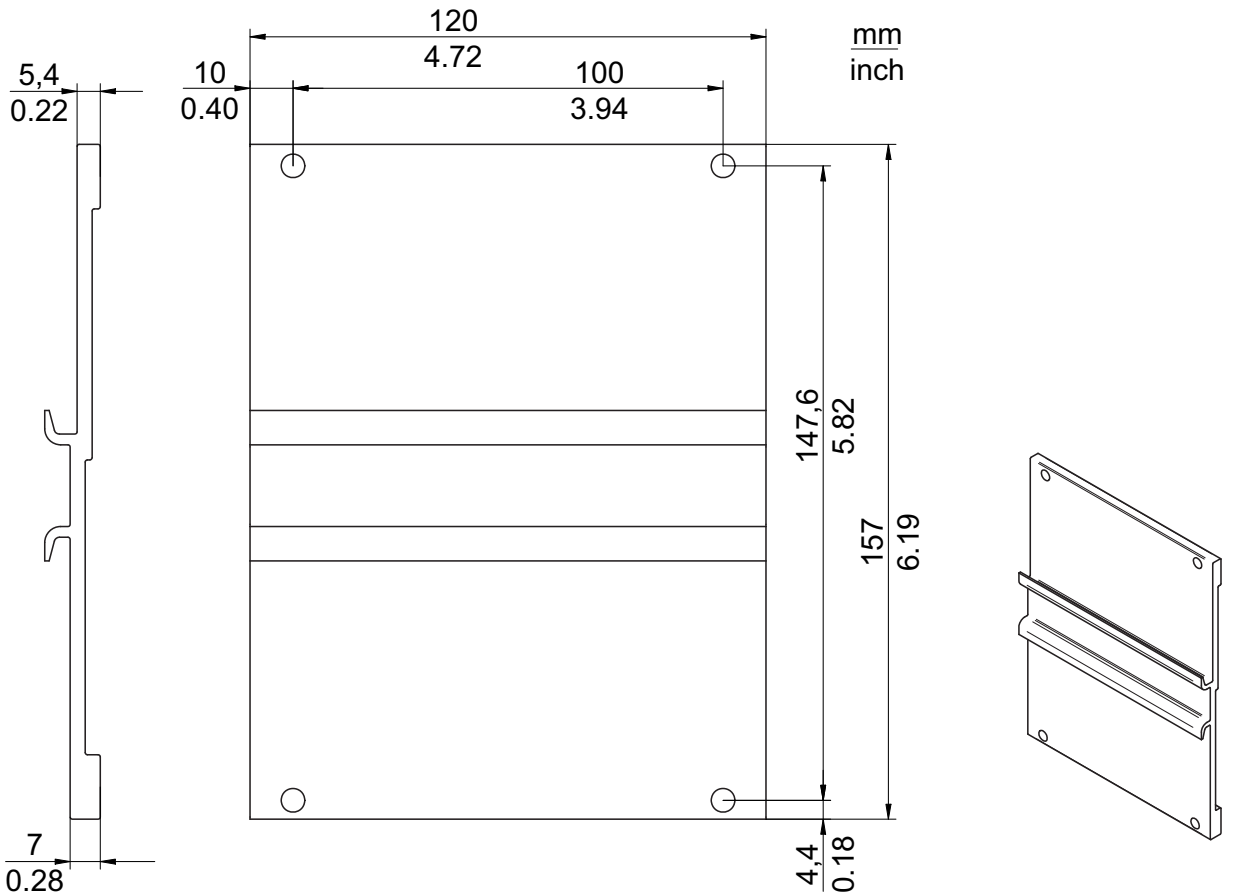
☐ Fasten on the wall mounting plate (width 120 mm / 4.73 in) (see on page 53 „Accessories“) on a level wall surface using four screws.

☐ Mount the device on the wall plate as shown in the illustration. Attach the upper snap-in guide of the device into the rail and press it down against the rail until it snaps into place.

Dimension drawings



Bohrlöcherzeichnung für Wandmontageplatte



Grounding

The device is grounded via the separate ground screw on the front panel of the device.
The devices have a protective conductor connection.

☐ Connect the protective conductor to the ground screw of the device.

☐ Connect the protective conductor before you set up the other connections. When removing the connection, you remove the protective conductor last.

☐ Connect both protective conductors if your device is equipped with two power supplies units.

2.1.6 Installing the terminal blocks; start-up procedure

Mounting the terminal blocks

☐ Mount the terminal blocks for the voltage supply and signal contact on the front of the device using screws.

Installation

By connecting the voltage supply via the terminal blocks, you start the operation of the device.

2.1.7 Connecting the data lines

You can connect terminal devices and other segments at the ports of the device via twisted pair cables and F/O cables.

☐ Install the data lines according to your requirements.

- **10/100 Mbit/s twisted pair connection (RJ45 sockets)**
  10/100 Mbit/s ports enable the connection of terminal devices or independent network segments according to the IEEE 802.3 100BASE-TX / 10BASE-T standard.
  These ports support:
  - Autonegotiation
  - Autopolarity
  - Autocrossing (if autonegotiation is activated)
  - 100 Mbit/s half duplex mode, 100 Mbit/s full duplex mode
  - 10 Mbit/s half duplex mode, 10 Mbit/s full duplex mode

  Delivery condition: Autonegotiation activated except for the HIPER-Ring ports: 100 Mbit/s, full duplex.

  The socket housing is electrically connected to the bottom panel.

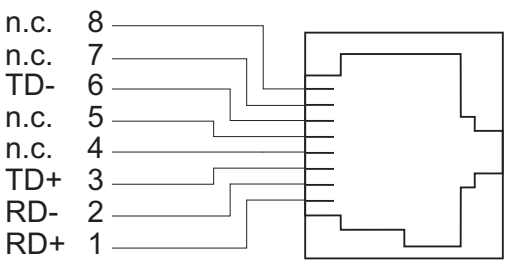


Figure 7: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

Note: In substation applications, the RJ45 ports are used to connect to additional communication devices such as routers or telecommunication multiplexers that are installed in close proximity to the device (i.e. less than 3 meters / 9.83 ft). It is not recommended to use these ports for connection to field devices across longer distances which could cause a significant increase in the ground potential (Ground Potential Rise GPR, i.e. more than 2500 V).

- **10/100/1000 Mbit/s twisted pair connection (RJ45 socket)**
  1000 Mbit/s twisted pair ports enable the connection of terminal devices or independent network segments according to the IEEE 802.3-2000 (ISO/IEC 8802-3:2000) 1000BASE-T standard.
  These ports support:
  - Autonegotiation
  - Autopolarity

- Autocrossing (if autonegotiation is activated)
- 1000 Mbit/s, full duplex
- 100 Mbit/s half duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half duplex mode, 10 Mbit/s full duplex mode

Delivery condition: Autonegotiation.

The socket housing is electrically connected to the front panel. The pin assignment corresponds to MDI-X.

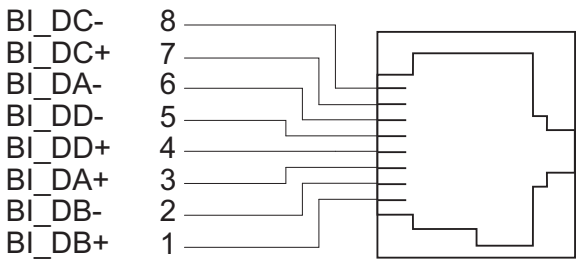


Figure 8: Pin assignment of the 1000 Mbit/s twisted pair interface

Note: In general, you should adhere to the following recommendations for data cable connections using copper in environments with high electrical interference levels:

- Keep the length of the data cables as short as possible - ideally max. 3m long. You should not use any copper data cables for the data transmission between buildings.
- Power supply and data cables should not run parallel over longer distances, and ideally they should be installed in separate cable channels. If the inductive coupling has to be reduced, the power supply and data cables should cross at a 90° angle.
- You may also choose to use shielded cables. Ground the cable shielding at one point in order to avoid causing a ground loop.

100 Mbit/s-F/O connection

100 Mbit/s F/O ports (MTRJ, ST or DSC) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard. These ports support:

- Full or half-duplex mode

Delivery condition: Full duplex

Note: Make sure that the LH ports are only connected with LH ports, SM ports are only connected with SM ports and MM ports only with MM ports.

1 Gbit/s F/O connection (SFP slot)

1 GBit/s F/O ports enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3-2000 (ISO/IEC 8802-3:2000) 1000BASE-SX or 1000BASE-LX standards.
These ports support:

- Autonegotiation
- Full duplex mode

Delivery condition: Autonegotiation

The SFP slots of the combo ports support:
- 1 Gbit/s in compliance with the IEEE 802.3-2000 (ISO/IEC 8802-3:2000) 1000BASE-SX or 1000BASE-LX standard and
- 100 Mbit/s in compliance with the IEEE 802.3 100BASE-FX standard.

Note: For combo ports (SFP slot/RJ45 socket): You can use either the SFP slot or the RJ45 socket to connect data lines. If both are used, the assigned SFP slot switches off the related RJ45 port.

Note: Make sure that the LH ports are only connected with LH ports, SX ports are only connected with SX ports and LX ports only with LX ports.

2.2 Display elements

After establishing the operating voltage, the software starts and initializes itself. Afterwards, the device performs a self-test. During this process, various LEDs light up. The process lasts around 40 seconds.

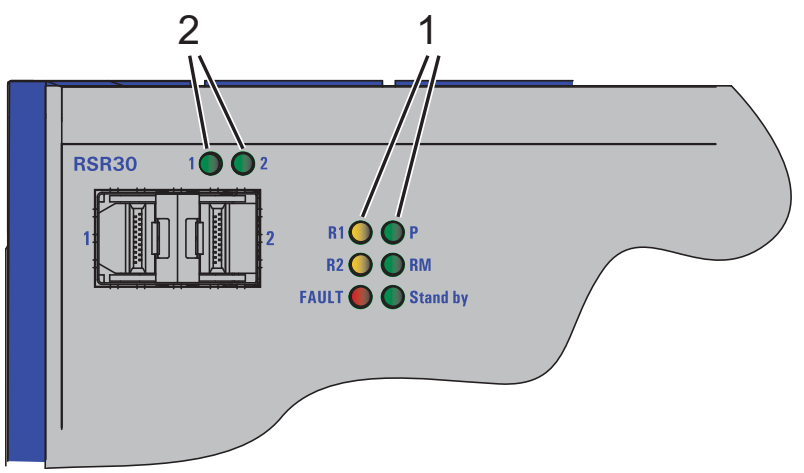


Figure 9: LED display elements
1 – Device state
2 – Port state

Device state

These LEDs provide information about conditions which affect the operation of the whole device.

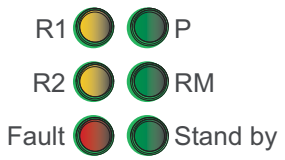


Figure 10: Device status LEDs

P - Power (green/yellow LED)	Meaning
Glowing green	Device variants with 1 power supply unit: Supply voltage is on
Glowing yellow	Device variants with 2 power supply units: There is only one supply voltage (P1 or P2) on
Not glowing	Supply voltage is too low
RM - Ring Manager (green/yellow LED)	
Glowing green	RM function active, redundant port disabled
Glowing yellow	RM function active, redundant port enabled
Not glowing	RM function not active
Flashing green	Incorrect configuration of the HIPER-Ring (e.g. the ring is not connected to the ring port).
Stand-by (green LED)	**Meaning**
Glowing green	Standby mode enabled
Not glowing	Stand-by mode not enabled
RM and StandBy during read and write access - display saving processes	
Flashing alternately	Error during saving process.
LED's flash synchronously, two times a second	Loading configuration from the AutoConfiguration Adapter ACA or from the device.
LED's flash synchronously, once a second	Saving the configuration in the AutoConfiguration Adapter ACA or in the device.

RM and stand-by during read and write access - display saving processes	
Flashing alternately	Error during saving process.
LED's flash synchronously, two times a second	Loading configuration from the Memory Backup Adapter EAM.
LED's flash synchronously, once a second	Saving the configuration in the Memory Backup Adapter EAM.

Applies to software releases previous to 06.0.00:

LED	Display	Color	Activity	Meaning
FAULT	Signal contact 1	Red	Lights up	The signal contact is open, it is reporting an error.
			None	Signal contact is closed, it is not reporting an error.

Applies to software release 06.0.00 and higher:

LED	Display	Color	Activity	Meaning
FAULT	Signal contact 1	Red	Lights up	The signal contact is open, it is reporting an error.
			None	Signal contact is closed, it is not reporting an error.
	Duplicate IP detection	Red	Flashing 4 times a period	Reports an IP conflict.

Applies to software releases previous to 06.0.00:

LED	Display	Color	Activity	Meaning
R1	Signal contact 1	Yellow	Lights up	The signal contact is closed in manual operation.
			None	The signal contact is open in manual operation.
R2	Signal contact 2	Yellow	Lights up	The signal contact is closed in manual operation.
			None	The signal contact is open in manual operation.

Applies to software release 06.0.00 and higher:

LED	Display	Color	Activity	Meaning
R1	Signal contact 1	Yellow	Lights up	The signal contact is open.
			None	The signal contact is closed.
R2	Signal contact 2	Yellow	Lights up	The signal contact is open.
			None	The signal contact is closed.

If the manual adjustment is active on the signal contact, then the error display is independent of the setting of the signal contact.

Port state

These LED's display port-related information. During the boot phase, these LED's are used to display the status of the boot procedure.

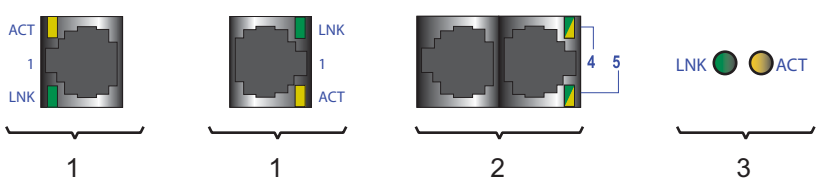


Figure 11: Port status LEDs

1 – Port status LEDs for isolated or single-row RJ45 sockets: one green and one yellow LED per port.
2 – Port status LEDs for double-row RJ45 sockets: one LED per port, glowing/flashing either green or yellow.
3 – Port status LEDs for DSC, SFP

1 to n - data, link status (green/yellow LED)	Meaning
Not glowing	No valid connection
Glowing green	Valid connection
Flashing green (1 time a period)	Port is switched to stand-by
Flashing green (3 time a period)	Port is disabled
Flashing yellow	Data reception at corresponding port

2.3 Basic set-up

The IP parameters must be entered when the device is installed for the first time. The device provides 6 options for configuring IP addresses:

- Entry via V.24 connection
- Entry using the HiDiscovery protocol
- Configuration via BOOTP
- Configuration via DHCP
- Configuration via DHCP Option 82
- Auto Configuration Adapter

Further information on the basic settings of the device can be found in the "Basic Configuration" user manual on the CD ROM.

Default settings

- IP address: The device looks for the IP address using DHCP
- Management password:
  user, password: public (read only)
  admin, password: private (read and write)
- V.24 data rate: 9,600 Baud
- Ring redundancy: disabled
- Ethernet ports: link status is not evaluated (signal contact)
- Optical 100 Mbit/s ports: 100 Mbit/s full duplex
  All other ports: Autonegotiation
- Ring Manager: disabled
- Stand-by coupling: disabled
- Rapid Spanning Tree (RSTP): enabled

USB interface

The USB socket has an interface for the local connection of an AutoConfiguration Adapter ACA 21-USB. It is used for saving/loading the configuration data and diagnostic information, and for loading the software.

The USB interface has the following properties:

- Supports the USB Master mode

- Supports USB 1.1 (data rate max. 12MBit/s)
- Connectors: type A
- Power intake limited to 500mA
- Voltage not potential-separated

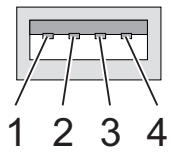
Figure	Pin	Function
	1	VCC (VBus)
	2	- Data
	3	+ Data
	4	Ground (GND)

Table 19: Pin assignment of the USB interface

V.24 interface (external management)

A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables a connection to the Command Line Interface (CLI) and the system monitor to be made.

VT 100 terminal settings	
Speed	9,600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device. The V24 interface is electrically isolated from the supply voltage.

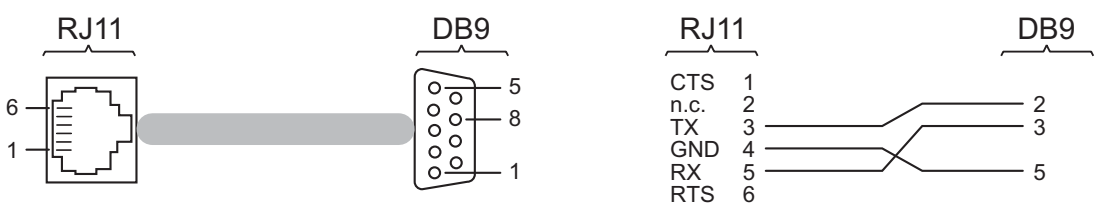


Figure 12: Pin assignment of the V.24 interface and the DB9 connector

Note: You will find the order number for the terminal cable, which is ordered separately, in the Technical Data chapter (see page 53).

2.4 Disassembly

Removing the device from the DIN rail

☐ To take the device off the DIN rail, insert a screwdriver horizontally under the housing into the locking slide, pull it (without tipping the screwdriver) downwards and lift the device upwards.

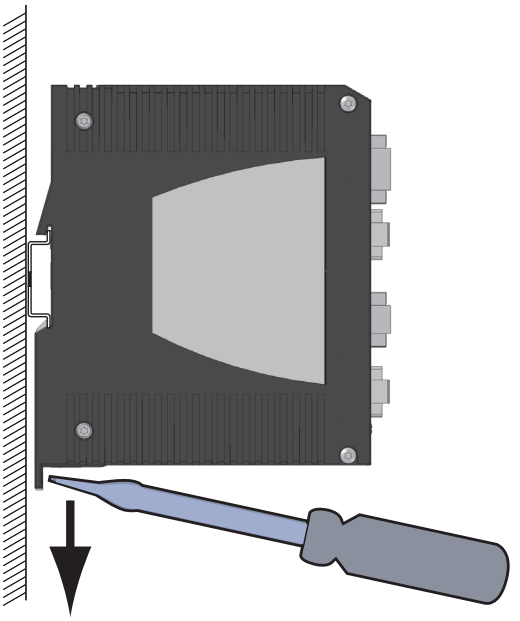


Figure 13: Removal from the DIN rail

Removing the device from the wall mounting plate

☐ To remove the device from the rail of the wall plate, press the device downwards and pull it out from under the rail.

Disassembling the SFP modules

☐ Pull the SFP modules by the opened lock out of the socket.

☐ Close the socket with the protective cap.

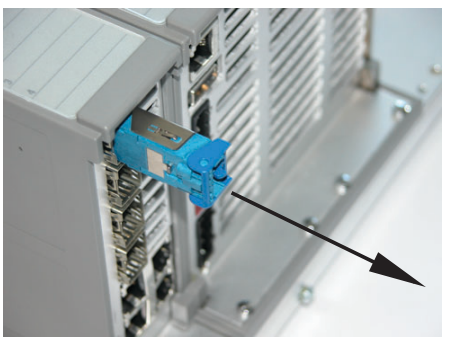


Figure 14: Disassembling an SFP module

3 Technical data

General technical data

Dimensions W x H x D	RSR20-.../RSR30-... RSR20-.../RSR30-... incl. wall holder	120 mm x 137 mm x 115 mm 120 mm x 145 mm x 115 mm
Weight	RSR20-.../RSR30-...	appr. 1 kg
Power supply Power supply unit type "K"	Nominal voltage AC Voltage range AC Nominal voltage DC Voltage range DC Connection type Power failure bridging Fuse	110 - 230 V, 50 - 60 Hz 90 - 265 V, 47 - 63 Hz (incl. max. tolerances) 60 - 250 V [a] 48 - 320 V (incl. max. tolerances) 3-pin terminal block > 10 ms for 98 V AC installed in power supply unit
Power supply Power supply unit type "C"	Nominal voltage DC Voltage range DC Connection type Power failure bridging Fuse	24 - 48 V 18 - 60 V (incl. max. tolerances) 2-pin terminal block > 10 ms for 20.4 V DC installed in power supply unit
Signal contact	Nominal value with AC Nominal value with DC Connection type	2 A at 230 V AC (500 VA) 2 A at 30 V DC 0.2 A at 125 V DC 0.1 A at 250 V DC 2-pin terminal block
Environment	Storage temperature (ambient air temperature) Humidity Atmospheric pressure	Standard: -40 °C to +85 °C (-40 °F bis +185 °F) Extended: -40 °C to +85 °C (-40 °F bis +185 °F) 10% to 95% (non-condensing) Up to 2000 m / 1.24 miles (795 hPa), higher altitudes on request
Operating temperature	Standard Extended	0 °C to +60 °C -40 °C to +85 °C [bc]
Pollution degree		2
Protection classes	Laser protection Protection class	Class 1 according to EN 60825-1 (2001) IP 30

a. Note: For 60 V DC voltage supply, railway standard EN 50155 is not fulfilled (Railway applications, electronic equipment used on rolling stock).

b. Please note the maximum number of SFP modules that you can use in the RSR30-0703:
- at an ambient temperature of 85 °C: max. 6 SFP modules
- at an ambient temperature of 75 °C: max. 8 SFP modules
- at an ambient temperature of 70 °C: max. 10 SFP modules

c. The RSR20/RSR30 devices must be equipped with SFP modules with an extended temperature range.

EMC and immunity

IEC/EN 61850-3:2002 EMI TYPE tests, test in comp. with	Description	Certification C Test level	Certification H Test level
IEC/EN 61000-4-2	ESD		
	Contact discharge	+/- 8 kV	+/- 8 kV
	Air discharge	+/- 15 kV	+/- 15 kV
IEC/EN 61000-4-3	Electromagnetic field		
	80 - 2700MHz	20 V/m	20 V/m
IEC/EN 61000-4-4	Burst		
	DC Power line	+/- 4 kV (2.5 kHz)	+/- 4 kV (2.5 kHz)
	AC Power line	+/- 4 kV (2.5 kHz)	+/- 4 kV (2.5 kHz)
	Data line	+/- 4 kV (2.5 kHz)	+/- 4 kV (2.5 kHz)
IEC/EN 61000-4-5	Surge		
	DC Power line	+/- 2 kV line / earth; +/- 1 kV line / line	+/- 2 kV line / earth; +/- 1 kV line / line
	AC Power line	+/- 4 kV line / earth; +/- 2 kV line / line	+/- 4 kV line / earth; +/- 2 kV line / line
	Data line	+/- 4 kV line / earth	+/- 4 kV line / earth
IEC/EN 61000-4-6	Conducted interference voltage		
	50kHz - 80MHz	10 V	10 V
IEC/EN 61000-4-12	Damped oscillation		
	DC Power line	+/- 2.5kV line / earth; +/- 1kV line / line	+/- 2.5kV line / earth; +/- 1kV line / line
	AC Power line	+/- 2.5kV line / earth; +/- 1kV line / line	+/- 2.5kV line / earth; +/- 1kV line / line
	Data line	+/- 2.5kV line / earth; +/- 1kV line / line	+/- 2.5kV line / earth; +/- 1kV line / line
IEC 60255-5	Electrical strength		
	DC Power line power supply unit type C	500 VAC[a]	500 VAC[a]
	AC Power line power supply unit type K	2000 VAC[b]	2000 VAC[b]
	DC Power line power supply unit type K	2000 VAC[b]	2000 VAC[b]
	Signal contact type C and K	2000 VAC	2000 VAC

a. This voltage ist limited to 60 VDC (1 mA) by protective components.
b. This voltage ist limited to 450 VDC (1 mA) by protective components.

IEEE 1613:2009 EMI TYPE tests, test in comp. with	Description	Certification C Test level	Certification H Test level
IEEE C37.90.3	ESD		
	Contact discharge	+/- 8 kV	+/- 8 kV
	Air discharge	+/- 15 kV	+/- 15 kV
IEEE C37.90.2	Electromagnetic field		
	80 - 2700MHz	35 V/m (peak)	35 V/m (peak)

IEEE 1613:2009 EMI TYPE tests, test in comp. with	Description	Certification C Test level	Certification H Test level
IEEE C37.90.1	Burst		
	DC Power line	+/- 4 kV (2.5 kHz)	+/- 4 kV (2.5 kHz)
	AC Power line	+/- 4 kV (2.5 kHz)	+/- 4 kV (2.5 kHz)
	Data line	+/- 4 kV (2.5 kHz)	+/- 4 kV (2.5 kHz)
IEEE C37.90.1	Damped oscillation		
	DC Power line	+/- 2.5kV line / earth; +/- 1kV line / line	+/- 2.5kV line / earth; +/- 1kV line / line
	AC Power line	+/- 2.5kV line / earth; +/- 1kV line / line	+/- 2.5kV line / earth; +/- 1kV line / line
	Data line	+/- 2.5kV line / earth; +/- 1kV line / line	+/- 2.5kV line / earth; +/- 1kV line / line
IEEE C37.90	H.V. Impulse		
	DC Power line	+/- 5 kV line / earth	+/- 5 kV line / earth
	AC Power line	+/- 5 kV line / earth	+/- 5 kV line / earth
IEEE C37.90	Electrical strength		
	DC Power line power supply unit type C	500 VAC[a]	500 VAC[1]
	AC Power line power supply unit type K	2000 VAC[b]	2000 VAC[2]
	DC Power line power supply unit type K	2000 VAC[2]	2000 VAC[2]
	Signal contact type C and K	2000 VAC	2000 VAC

a. This voltage ist limited to 60 VDC (1 mA) by protective components.
b. This voltage ist limited to 450 VDC (1 mA) by protective components.

Environment TYPE tests, test in comp. with	Description	Certification C Test level	Certification H Test level
IEC 60068-2-1	Cold	-40 °C, 16 hours	-40 °C, 16 hours
IEC 60068-2-2	Dry heat	+85 °C, 16 hours	+85 °C, 16 hours
IEC 60068-2-30	Relative humidity	95 % (non-condensed), 55 °C 4 cycles	95 % (non-condensed), 55 °C 4 cycles
IEC 60068-2-6	Vibration, test Fc	2- 9 Hz with 3 mm amplitude 1 g at 9 - 200 Hz 1.5 g at 200 - 500 Hz	2- 9 Hz with 3 mm amplitude 1 g at 9 - 200 Hz 1.5 g at 200 - 500 Hz
IEC 60068-2-27	Shock, test Ea	15 g at 11 ms	15 g at 11 ms
IEC 60068-2-27	Shock	5 g at 30 ms	-
IEC 60068-2-64	Vibration	5 Hz - 150 Hz broadband noise [a]	-

a. In operation: 0.75 m/s2 (vertical), 0.50 m/s2 (horizontal), 10 min / axis
During storage:5.9 m/s2 (vertical), 3.9 m/s2 (horizontal), 5 h / axis

EMC emitted interference	Certification C	Certification H
EN 55022	Class A	Class A

EMC emitted interference	Certification C	Certification H
FCC 47 CFR Part 15	Class A	Class A
German Lloyd	Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003	Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003

Network range

TP port	
Length of a twisted pair segment	max. 100 m / 328 ft (cat5e cable with 1000BASE-T)

Table 20: TP port 10BASE-T / 100BASE-TX / 1000BASE-T

Product code		Wavelength	Fiber	System attenuation	Expansion	Fiber data
JJ, MM, NN, M2, M3, M4	MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km, 800 MHz*km
JJ, MM, NN, M2, M3, M4	MM	1300 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km, 500 MHz*km
VV, UU, S2, S4	SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0.4 dB/km; 3.5 ps/(nm*km)
LL, L2	LH	1550 nm	9/125 µm	7-29 dB	24-86 km	0.3 dB/km; 19 ps/(nm*km)
GG, G2	LH+	1550 nm	9/125 µm	14-47 dB	67-176 km	0.25 dB/km; 19 ps/(nm*km)

Table 21: F/O port 100BASE-FX

Product code		Wavelength	Fiber	System attenuation	Expansion	Fiber data
-MM/LC...	MM	1310 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km, 800 MHz*km
-MM/LC...	MM	1310 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km, 500 MHz*km
-SM/LC...	SM	1310 nm	9/125 µm	0-13 dB	0-25 km	0.4 dB/km; 3.5 ps/(nm*km)
-SM+/LC...	SM	1310 nm	9/125 µm	10-29 dB	25-65 km	0.4 dB/km; 3.5 ps/(nm*km)
-LH/LC	SM	1550 nm	9/125 µm	10-29 dB	40-104 km	0.25 dB/km; 19 ps/(nm*km)

Table 22: F/O port 100BASE-FX (SFP Fiberoptic Fast ETHERNET transceiver)

Product code M-SFP-...		Wave length	Fiber	System attenuation	Expansion	Fiber data
-SX/LC...	MM	850 nm	50/125 µm	0-7.5 dB	0-550 m	3.0 dB/km, 400 MHz*km
-SX/LC...	MM	850 nm	62.5/125 µm	0-7.5 dB	0-275 m	3.2 dB/km, 200 MHz*km
-MX/LC...	MM	1310 nm	50/125 µm	0-8 dB	2 km [a]	1.0 dB/km, 500 MHz*km
-MX/LC	MM	1310 nm	62.5/125 µm	0-8 dB	1 km	1.0 dB/km, 500 MHz*km
-LX/LC...	MM	1310 nm[b]	50/125 µm	0-11 dB	0-550 m	1.0 dB/km, 800 MHz*km
-LX/LC...	MM	1310 nm [b]	62.5/125 µm	0-11 dB	0-550 m	1.0 dB/km, 500 MHz*km
-LX/LC...	SM	1310 nm	9/125 µm	0-11 dB	0-20 km	0.4 dB/km; 3.5 ps/(nm*km)
-LX+/LC	SM	1310 nm	9/125 µm	5-20 dB	14-42 km	0.4 dB/km; 3.5 ps/(nm*km)
-LH/LC...	LH	1550 nm	9/125 µm	6-22 dB	24-72 km	0.25 dB/km; 19 ps/(nm*km)
-LH+/LC	LH	1550 nm	9/125 µm	15-32 dB	60-120 km	0.25 dB/km; 19 ps/(nm*km)

Table 23: Fiber port 1000BASE-FX (SFP fiber optic Gigabit ETHERNET Transceiver)

a. Distances up to 3 km reachable, 1000 MHz*km (1300 nm)
b. With F/O adapter compliant with IEEE 802.3-2002 clause 38 (single-mode fiber offset-launch mode conditioning patch cord)

MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

Power consumption/power output, order numbers

You can obtain the product code for the devices (order number) from the above table (see table 2) .

RSR device	Power consumption (incl SFP modules)	Power output (incl SFP modules)
3 x combo port and 6 x TX port (100 Mbit/s)	15 W	51 Btu (IT)/h
2 x combo port, 2 x SFP slot (100 Mbit/s) and 6 x TX port (100 Mbit/s)	16 W	55 Btu (IT)/h
2 x combo port and 8 x TX port (100 Mbit/s)	14 W	48 Btu (IT)/h
2 x SFP slot (1000 Mbit/s), 2 x SFP slot (100 Mbit/s) and 6 x TX port (100 Mbit/s)	14 W	48 Btu (IT)/h
2 x SFP slot (1000 Mbit/s) and 8 x TX port (100 Mbit/s)	12 W	41 Btu (IT)/h
3 x SFP slot (1000 Mbit/s) and 7 x SFP slot (100 Mbit/s)	21 W	72 Btu (IT)/h
3 x FX port (100 Mbit/s) and 6 x TX port (100 Mbit/s)	14 W	48 Btu (IT)/h
2 x FX port (100 Mbit/s) and 6 x TX port (100 Mbit/s)	12 W	41 Btu (IT)/h
8 x TX port (100 Mbit/s)	10 W	34 Btu (IT)/h

Scope of delivery

Device	Scope of delivery
RSR20-.../ RSR30-...	RSR20-.../RSR30-... Device 1 to 2 terminal blocks for the voltage supply, depending on the device variant: - 2-pin for low voltage inputs - 3-pin for high voltage inputs 2 terminal blocks (2-pin) for signal contacts CD ROM with user manual Installation user manual

Accessories

Note: Please note that products recommended as accessories may have characteristics that do not fully correspond to those of the corresponding product. This may limit their possible usage in the overall system.

Name	Order number
AutoConfiguration Adapter ACA 21-USB	943 271-001
Terminal cable	943 301-001
3-pin terminal block (50 pcs.) for voltage supply (high voltage input 48 to 265 V DC or 90 to 320 V AC)	943 845-008
2-pin terminal block (50 pcs.) for voltage supply (low voltage input 18 V ... 60 V DC)	943 845-009
2-pin terminal block (50 pcs.) for signal contact	943 845-010
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC	943 662-120
Rail Power Supply RPS60/48V EEC (for Power over Ethernet)	943 952-001
HiVision Network Management software	943 471-100
OPC Server software HiOPC	943 055-001
Wall mounting plate for mounting the RSR on the wall, width 120 mm	943 971-001
Wall mounting plate for mounting the RSR on the wall, width 90 mm	943 971-002
Wall mounting plate for mounting the RSR on the wall, width 60 mm	943 971-003

Name	Operating temperature ambient air temperature	Order number
Fast ETHERNET SFP modules:		
M-FAST SFP-MM / LC	0 °C to +60 °C	943 865-001
M-FAST SFP-MM / LC EEC	-40 °C to +70 °C	943 945-001
M-FAST SFP-SM / LC	0 °C to +60 °C	943 866-001
M-FAST SFP-SM / LC EEC	-40 °C to +70 °C	943 946-001
M-FAST SFP-SM+/ LC	0 °C to +60 °C	943 867-001
M-FAST SFP-SM+/ LC EEC	-40 °C to +70 °C	943 947-001
M-FAST SFP-LH / LC	0 °C to +60 °C	943 868-001
Gigabit ETHERNET SFP modules:		
M-SFP-SX/LC	0 °C to +60 °C	943 014-001
M-SFP-SX / LC EEC	-40 °C to +70 °C	943 896-001
M-SFP-MX / LC	0 °C to +60 °C	942 035-001
M-SFP-LX/LC	0 °C to +60 °C	943 015-001
M-SFP-LX / LC EEC	-40 °C to +70 °C	943 897-001
M-SFP-LX+ / LC	0 °C to +60 °C	942 023-001
M-SFP-LX+/ LC EEC	-40 °C to +70 °C	942 024-001
M-SFP-LH/LC	0 °C to +60 °C	943 042-001
M-SFP-LH / LC EEC	-40 °C to +70 °C	943 898-001
M-SFP-LH+/LC	0 °C to +60 °C	943 049-001

Underlying norms and standards

Name	
EN 61000-6-2:2005	Generic norm – immunity in industrial environments
EN 55022:2006 + A1:2007	IT equipment – radio interference characteristics
EN 61131-2:2003	Programmable logic controllers
EN 50121-4:2000	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
FCC 47 CFR Part 15:2009	Code of Federal Regulations
German Lloyd	Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003
cUL 508:1998	Safety for Industrial Control Equipment
IEC/EN 61850-3	Communications networks and systems in stations
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations
50155:2001 + A1:2002 Declaration	Railway applications, electronic equipment used on rolling stock
BUREAU VERITAS	Rules for the Classification of Steel Ships

Table 24: List of norms and standards

IEEE 802.1 D	Switching, GARP, GMRP, Spanning Tree
IEEE 802.1 D-1998	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.1 Q	Tagging
IEEE 802.1 Q-1998	Virtual Bridged Local Area Networks (VLAN Tagging, GVRP)
IEEE 802.1 w.2001	Rapid Reconfiguration
IEEE 802.3-2002	Ethernet

Table 25: List of IEEE standards

The device has a certification based on a specific standard only if the certification indicator appears on the housing.
However, with the exception of Germanischer Lloyd, ship certifications as well as RINA certifications are only included in the product information under www.beldensolutions.com.

A Further Support

Technical Questions and Training Courses

In the event of technical queries, please contact your local Hirschmann distributor or Hirschmann office.
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- Fax +49 7127 14-1551

Answers to Frequently Asked Questions can be found on the Hirschmann internet site (www.beldensolutions.com) at the end of the product sites in the FAQ category.
The current training courses to technology and products can be found under http://www.hicomcenter.com.

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